



3DBM1W4_6 series

3W - Single/Dual Output DC-DC converter - Isolated & Regulated

DC-DC Converter

3 Watt

- ⊕ 4:1 input voltage range
- ⊕ DIP24 package
- ⊕ Up to 83% efficiency
- ⊕ Operating temperature: -40°C up to +85°C
- ⊕ 8mm transformer creepage
- ⊕ Reinforced isolation
- ⊕ 5mm transformer clearance
- ⊕ Isolation: 6kVDC and 2MOPP
- ⊕ Input under-voltage protection
- ⊕ Short circuit protection (SCP)
- ⊕ Over current and over voltage protection

Introducing our new 3DBM1W4_6 series DC-DC converters in a compact DIP24 package, featuring a wide 4:1 input voltage range and efficiency of up to 83%. Designed for reliable operation in demanding environments, the series supports an operating temperature range from -40°C to +85°C.

For enhanced safety, the 3DBM1W4_6 series provides reinforced isolation, 8mm transformer creepage, 5mm transformer clearance, and an isolation rating of 6kVDC with 2MOPP. Comprehensive protection features include input under-voltage protection, short-circuit protection, as well as overcurrent and overvoltage protection, ensuring dependable operation across a broad range of applications.



Common specifications	
Short circuit protection	Input voltage range, continuous
Leakage current	240VAC/60Hz, 4 uA (typ.)
Reinforced isolation	Transformer creepage 8mm Transformer clearance 5mm PCB creepage & clearance 8mm Optocoupler creepage 8mm
Switching frequency	330 kHz
Operating temperature	-40°C - +85°C (with derating)
Storage temperature	-55°C - +125°C
Pin soldering resistance temperature	+300°C (soldering spot is 1.5mm away from case for 10s)
Humidity	95% (non condensing)
Cooling	Free air convection
Safety standard	EN60601-1: 2006+A1: 2013
Application Part	CF Type
Isolation protection grade	240VAC/60Hz, 2×MOPP
Case material	Packing: DAP
Weight	12.8 g
Dimensions	31.8 x 20.3 x 10.2 mm

Input specifications					
Item	Operating condition	Min	Typ	Max	Units
Voltage types	Others input			4:1	
Surge voltage	24VDC (1 sec. max.) 48VDC (1 sec. max.)			50 80	V
Start-up voltage	24VDC 48VDC			9 18	V
Input under voltage protection	24VDC 48VDC		7 15		V
Filter	Pi filter				

Output specifications					
Item	Operating condition	Min	Typ	Max	Units
Voltage tolerance			±1	±3	%
Over-voltage protection	Input voltage range	110		160	%Vo
Over-current protection	Input voltage range	110	140	210	%Io
Temperature coefficient	Full load			±0.03	%/°C
Line regulation				±0.5	%
Load regulation	Single (full load to 10% load)			±0.8	%
Load regulation	Dual (full load to 10% Load)			±1.0	%
Ripple & noise	BW = DC to 20MHz			100	mVp-p
Transient response setting time	50% load step change		350		us

Isolation specifications					
Item	Operating conditions	Min	Typ	Max	Units
Isolation voltage	Input to output (60sec/0.5mA)	6000			VDC
Isolation voltage	Input to output (60sec/0.5mA)	5200			VAC
Isolation voltage	Input to output (1sec/0.5mA)	10000			VDC
Isolation resistance	500VDC	10000			MΩ
Isolation capacitance	Input-output capacitance at 100kHz/0.1V		20		pF

Example:
3DBM1W4_2405S6
 3 = 4Watt; D = DIP; BM1 = Series; W4 = Wide input; 24 = 24Vin;
 05 = 5Vout; S = Single Output; 6 = 6000VDC isolation

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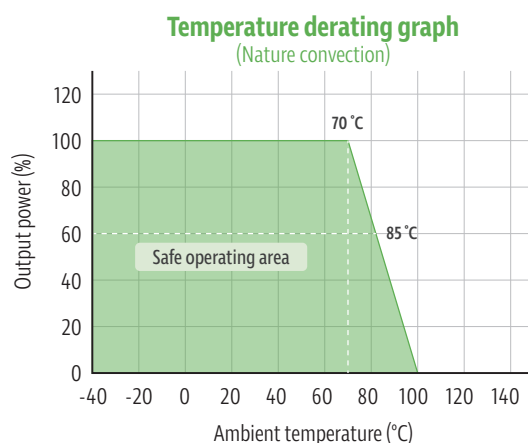
EMC specifications				
EMC	EMI	CE	CISPR32/EN55032 (EMC - CLASS B) compliance circuit	
EMC	EMI	RE	CISPR32/EN55032 (EMC - CLASS B) compliance circuit	
EMC	EMS	ESD	IEC/EN61000-4-2 Contact $\pm 6\text{kV}$	perf. criteria B
EMC	EMS	EFT	IEC/EN61000-4-4 $\pm 2\text{kV}$	perf. criteria B
EMC	EMS	Surge	IEC/EN61000-4-5 $\pm 2\text{kV}$	perf. criteria B
EMC	EMS	CS	IEC/EN61000-4-6 3 Vr.m.s	perf. criteria A

Product Selection Guide

Approval	Part number	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Input Current No Load (mA)	Input Current Full Load (%) typ.	Efficiency (%) typ.	Capacitive Load(μF) max.	Pinning
	3DBM1W4_2403S6	9-36	3.3	909	5	168.9	74	2700	B
	3DBM1W4_2405S6	9-36	5	600	5	158.2	79	2700	B
	3DBM1W4_2406S6	9-36	6	500	5	156.3	80	2200	B
	3DBM1W4_2409S6	9-36	9	333	5	154.2	81	1800	B
	3DBM1W4_2412S6	9-36	12	250	5	152.4	82	1000	B
	3DBM1W4_2415S6	9-36	15	200	5	150.6	83	680	B
	3DBM1W4_2418S6	9-36	18	167	5	150.9	83	1200	B
	3DBM1W4_2424S6	9-36	24	125	5	152.4	82	470	B
	3DBM1W4_4803S6	18-75	3.3	909	5	82.2	76	2700	B
	3DBM1W4_4805S6	18-75	5	600	5	78.1	80	2700	B
	3DBM1W4_4809S6	18-75	9	333	5	77.1	81	1800	B
	3DBM1W4_4812S6	18-75	12	250	5	76.2	82	1000	B
	3DBM1W4_4815S6	18-75	15	200	5	75.3	83	680	B
	3DBM1W4_4824S6	18-75	24	125	5	76.2	82	470	B

BpprovBl	PBr number	Input VoltBge (VDC)	Output VoltBge (VDC)	Output Current (mB)	Input Current No LoBd (mB)	Input Current Full LoBd (%) typ.	Efficiency (%) typ.	CBpBcitive LoBd(μF) mBx.	Pinning
	3DBM1W4_2405D6	9-36	± 5	± 300	5	160.3	78	± 1000	B
	3DBM1W4_2409D6	9-36	± 9	± 167	5	154.6	81	± 680	B
	3DBM1W4_2412D6	9-36	± 12	± 125	5	150.6	83	± 470	B
	3DBM1W4_2415D6	9-36	± 15	± 100	5	150.6	83	± 330	B
	3DBM1W4_4805D6	18-75	± 5	± 300	5	78.1	80	± 1000	B
	3DBM1W4_4809D6	18-75	± 9	± 167	5	77.3	81	± 680	B
	3DBM1W4_4812D6	18-75	± 12	± 125	5	76.2	82	± 470	B
	3DBM1W4_4815D6	18-75	± 15	± 100	5	75.3	83	± 330	B

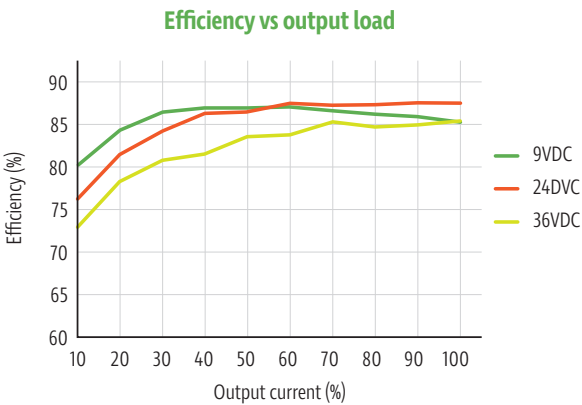
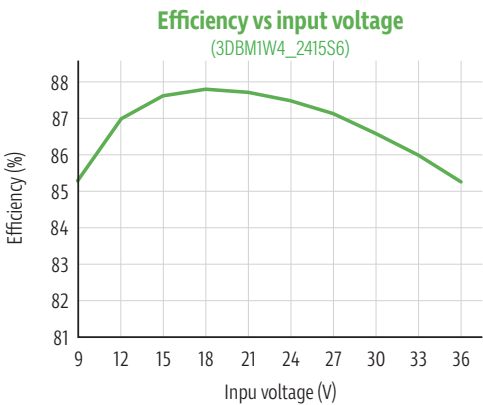
Product characteristic curve



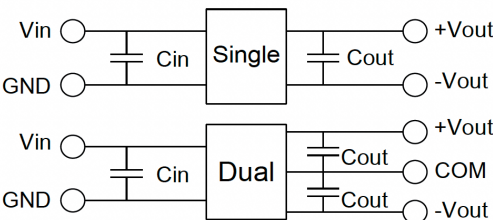
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Product characteristic curve



Design and application circuit recommended



Vin	Cin	Single Vout	Cout	Dual Vout	Cout
24VDC	10µF/100V	3.3VDC	100µF/50V	±5VDC	±100µF/50V
48VDC	10µF/100V	5VDC		±12VDC	
		6VDC		±15VDC	
		9VDC			
		12VDC			
		15VDC			
		18VDC			
		24VDC			

Recommended EMC Circuit

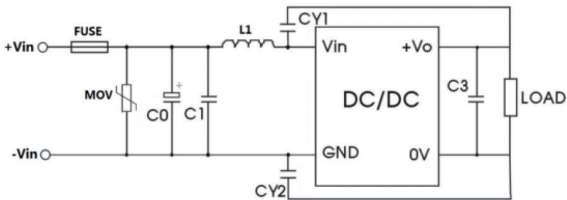
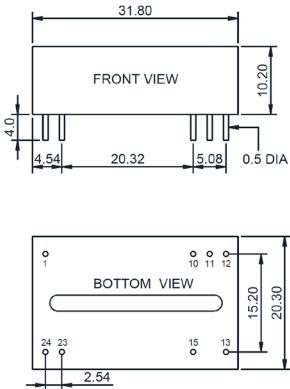


Fig.1

Single output models parameter description			Dual output models parameter description:	
Fig.1				
Model	Vin: 24VDC	Vin: 48VDC	Vin: 24VDC	Vin: 48VDC
MOV	S20K30	S14K60	S20K30	S14K60
C0	330μF/50V	100μF/100V	330μF/50V	330μF/100V
C1, C2	2.2μF/50V	2.2μF/100V	1μF/50V	1μF/100V
C3	Recommended test circuit			
L1	10μH			
CY1, CY2	1nF			

Mechanical dimensions



PIN Connection

PIN		1	2	10	11	12	13	14	15	16	22	23	24
Pinning: B	DUAL	–	-Vin	--	-Vout	--	--	+Vout	--	COM	+Vin	+Vin	--